

Lesson 1.6- SWBAT simplify polynomial expressions.

Kickoff- Simplify the following expressions.

1) Add $(4x^2 + 5x - 3) + (7x^3 - 7x + 1)$

$$\begin{array}{r} 4x^2 + 5x - 3 \\ + 7x^3 - 7x + 1 \\ \hline 7x^3 + 4x^2 - 2x - 2 \end{array}$$

2) $(3a^2 + 2a - 2) - (a^2 - 3a + 7)$

$$\begin{array}{r} 3a^2 + 2a - 2 \\ - a^2 + 3a - 7 \\ \hline 2a^2 + 5a - 9 \end{array}$$

3) Subtract $3x^2 - 7x - 5$ from $-x^2 - 3x - 1$

$$\begin{array}{r} -x^2 - 3x - 1 \\ - (3x^2 - 7x - 5) \\ \hline -4x^2 + 4x + 4 \end{array}$$

4) Simplify $x - 2[3x - (2 - 4x)]$

$$\begin{array}{r} x - 2[3x - 2 + 4x] \\ x - 2[7x - 2] \\ x - 14x + 4 \\ -13x + 4 \end{array}$$

When simplifying expressions, you should ALWAYS use the distributive property (when possible). Then try combining like terms!!

Examples:

1) $3(x^2 - 2x + 3) - 4(x + 1)$

$$\begin{array}{r} 3x^2 - 6x + 9 \\ - 4x - 4 \\ \hline 3x^2 - 10x + 5 \end{array}$$

2) $(0.5x^2 + 4.25x - 0.9) - (0.5x^2 + 7x - 3)$

$$\begin{array}{r} 0.5x^2 + 4.25x - 0.9 \\ - 0.5x^2 - 7x + 3 \\ \hline -2.75x + 0.6 \end{array}$$

3) $7x - [2(x^2 - z) + 4x^2 - 7z] + 6z^2$

$$\begin{array}{r} 7x - [2x^2 - 2z + 4x^2 - 7z] + 6z^2 \\ 7x - [6x^2 - 9z] + 6z^2 \\ 7x - 6x^2 + 9z + 6z^2 \\ -6x^2 + 6z^2 + 7x + 9z \end{array}$$

4) Subtract $6x^2 - 3x + 1$ from $2x^2 + 3x + 2$

$$\begin{array}{r} 2x^2 + 3x + 2 \\ - 6x^2 + 3x - 1 \\ \hline -4x^2 + 6x + 1 \end{array}$$

Practice: Simplify each of the following polynomial expressions.

5) $-10(u + v) + 8(u - 1) - 3(u + 6)$	6) $-(3x^2 + 4z) - (6z^2 - 2)$
7) $2(x^2 - 3x + 1) - 3(x^2 + x + 3)$	8) $3(2x - x^2 + 4) + (3x^2 - 4x + 5)$

9) Subtract $(5 - 9a^3)$ from $(4a^2 + 6a - 3)$

10) Subtract $3x^2 + 7x + 3$ from $5x^2 - 2x - 1$

Directions: Simplify each of the following polynomial expressions.

11) $2(6x^2 + 4x + 1) + (4z + 20)$

$$\begin{array}{r} 12x^2 + 8x + 2 \\ + 4z + 20 \\ \hline 12x^2 + 8x + 4z + 22 \end{array}$$

12) $2(8x^3 - 6x + 10) - (x^3 + 10x - 9)$

$$\begin{array}{r} 16x^3 - 12x + 20 \\ - x^3 - 10x + 9 \\ \hline 15x^3 - 22x + 29 \end{array}$$

13) Subtract $-2(x^2 + 3x + 1)$ from $3(x^2 - 2x^2 + 2)$

$$\begin{array}{r} 3(x^2 - 2x^2 + 2) - (-2(x^2 + 3x + 1)) \\ 3x^2 - 6x^2 + 6 - (-x^2 - 6x - 2) \\ 3x^2 - 6x^2 + 6 + x^2 + 6x + 2 \\ -7x^2 + 6x + 8 \end{array}$$

<p>15) $(2x^2 - \frac{1}{2}x + 2) + (\frac{7}{12}x^2 + \frac{1}{3}x - \frac{1}{2})$</p> $\frac{31}{12}x^2 - \frac{1}{4}x + \frac{3}{2}$	<p>16) $0.4(x^2 - 0.2x + 0.3) - 0.8(x^2 - x)$</p> $0.4x^2 - 0.08x + 0.12 - 0.8x^2 + 0.8x$ $-0.4x^2 + 0.72x + 0.12$
<p>17) $(x^3 - 3x^2y + 4xy^2 + y^3) - (7x^3 - 9x^2y + xy^2 + y^3)$</p> $-6x^3 + 6x^2y + 3xy^2$	

Directions: Evaluate each of the following expressions or functions.

<p>18) $3x + 3y + xy - 3x^2y$ when $x = 1$ and $y = -1$</p> $3(1) + 3(-1) + (1)(-1) - 3(1)^2(-1)$ $= 2$	<p>19) $\frac{b^2 - c^2}{a - 2c}$ when $a = 2, b = 3$ and $c = -1$</p> $\frac{(3)^2 - (-1)^2}{2 - 2(-1)} = \frac{8}{4} = 2$
<p>20) $f(x) = 2x^2 - 1$ find $f(-3)$</p> $2(-3)^2 - 1$ $= 17$	<p>21) Let $q(r) = 2r^3 + 5r^2 - 6$ find $q(-3)$</p> $2(-3)^3 + 5(-3)^2 - 6$ $= -15$

<p>22) Given $h(x) = 3^2 + 2x - 2$ find $h(-6)$</p> $3^2 + 2(-6) - 2$ $= -5$	<p>23) $2xy - 4x + 3y$ when $x = -5$ and $y = 4$</p> $2(-5)(4) - 4(-5) + 3(4)$ $= -8$
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